PTO/SB/21 (modified) Approved for use through xx/xx/xx, OMB 0651-0031 Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE U.S. Department of Commerce Application Number 10/087,408 Rev. 10/95 Patent and Trademark Office Filing Date March 1, 2002 TRANSMITTAL FORM First Named Inventor **Xiaodong Huang** (to be used for all correspondence during pendency of Group Art Unit Number 2828 filed application) **Examiner Name** James W. Davie Total Number of Pages in This Submission Attorney Docket Number 22920-06460 **ENCLOSURES** (check all that apply) Fee Transmittal Form (in duplicate) Issue Fee Transmittal Check Enclosed Letter to Chief Draftsperson Return Receipt Postcard Formal Drawing(s): Response to Notice to File Missing Parts [] Sheet(s) of Figure(s) [] Assignment & Recordation Cover Sheet Appeal Communication to Board of Appeals and Interferences Declaration Power of Attorney Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) **Application Data Sheet** Information Disclosure Statement & PTO/SB/08A Certified Copy of Priority Document(s) Copies of IDS Cited References After Allowance Communication to Group Request for Corrected Filing Receipt Request for Correction of Recorded Assignment Amendment/Response: [] Page(s) . After Final Status Request Revocation and Substitute Power of Attorney REMARKS: * Does not include pages in reference(s). SIGNATURE OF ATTORNEY OR AGENT Signature: Attorney/Reg. No.: Michael W. Farn, Reg. No. 41,015 Dated: 2003 June

CERTIFICATE OF MAILING

I hereby certify that this correspondence, including the enclosures identified above, is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below. If the Express Mail Mailing Number is filled in below, then this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressed" service pursuant to 37 CFR 1.10.

| "Express Mail Post Office | e to Ad | Idressee, service pursuant to 37 CFR 1.10. | | |
|---------------------------|---------|--|--------|----------------|
| Signature: | U | behaefy d | , | |
| Typed or Printed Nan | ne: | Michael W. Farn | Dated: | June , 2003 |
| Express Mail Mailing | Numl | ber (optional): | | |

ICANT(S):

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Xiaodong Huang, Andreas Stintz, Kevin Malloy, Guangtian Liu,

Luke Lester and Julian Cheng

APPLICATION NO.:

10/087,408

FILING DATE:

March 1, 2002

TITLE:

Quantum Dot Vertical Cavity Surface Emitting Laser

EXAMINER:

James W. Davie

GROUP ART UNIT:

2828

ATTY, DKT, NO.:

22920-06460

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner For Patents, P.O. Box 1450, Alexandria, Y/A 22313-1450, on the date shown below:

Dated: June

. 2003

Bv:

Michael W. Farn, Reg. No. 41,015

COMMISSIONER FOR PATENTS

П

P.O. BOX 1450

ALEXANDRIA, VA 22313-1450

THIRD INFORMATION DISCLOSURE STATEMENT Under 37 CFR §§ 1.56 and 1.97-98

SIR:

Pursuant to the provisions of 37 CFR §§ 1.56 and 1.97-98, enclosed herewith is modified form PTO/SB/08A listing references for consideration by the Examiner. Enclosed is a copy of each listed reference that may be material to the examination of this application, and for which there may be a duty to disclose.

The filing of this Information Disclosure Statement shall not be construed as a representation regarding the completeness of the list of references, or that inclusion of a reference in this list is an admission that it is prior art or is pertinent to this application, or that a search has been made, or as an admission that the information listed is, or may be considered to be, material to patentability, or that no other material information exists, and shall not be construed as an admission against interest in any manner.

This Information Disclosure Statement is being filed:

within three months of the filing date of the application, or date of entry into the national stage of an international application, or before the mailing date of a first office action on the merits, whichever event last occurred;

| | before the n | nailing of a first official action after the filing of a request for |
|---|----------------|--|
| • | continued e | xamination (RCE) under 37 CFR § 1.114; |
| | after three n | nonths of the filing date of this national application or the date |
| | of entry of t | he national stage in an international application, or after the |
| | mailing date | e of the first official action on the merits, whichever event last |
| | occurred, bu | at before the mailing date of the first to occur of either: (1) a |
| | final action | under 37 CFR §1.113; or (2) an action that otherwise closes |
| | prosecution | in the application, and: |
| | ☐ atta | ched hereto is the fee set forth under 37 CFR §1.17(p) for |
| | subi | mission of this Information Disclosure Statement under 37 |
| | CFF | R.§ 1.97(c); OR |
| | ☐ App | licant certifies pursuant to 37 CFR § 1.97(e) that: |
| | | each item of information contained in this Information |
| | • | Disclosure Statement was first cited in a communication |
| | | from a foreign patent office in a counterpart foreign |
| | | application not more than three months prior to the filing of |
| | | this Statement; OR |
| | | no item of information contained in this Information |
| | | Disclosure Statement was cited in a communication from a |
| | | foreign patent office in a counterpart foreign application |
| | | and, to the knowledge of the person signing this |
| | | certification after making reasonable inquiry, no item of |
| | | information contained in this Statement was known to any |
| | | individual designated under 37 CFR § 1.56(c) more than |
| _ | | three months prior to the filing of this Statement; |
| Ц | on or before | the payment of the issue fee but after the mailing date of the |
| | first to occur | of either: (1) a final action under 37 CFR § 1.113; (2) a |
| | notice of allo | wance under 37 CFR § 1.311; or (3) an action that otherwise |
| | | ution in the application, and: |
| | ∐ Appli | cant certifies pursuant to 37 CFR. § 1.97(e) that: |
| | | each item of information contained in this Information |
| | | Disclosure Statement was cited in a communication from a |
| | | foreign patent office in a counterpart foreign application not |
| | | more than three months prior to the filing of this Statement; |
| | | or no item of information and item to be a second or the second of the second of the second of the second or the s |
| | | no item of information contained in this Information |
| | · | Disclosure Statement was cited in a communication from a |

| | • e** | foreign patent offi | ce in a counterpart foreign application |
|--------|-------------|--|--|
| • | | | edge of the person signing this |
| | | | making reasonable inquiry, no item of |
| | | information contai | ined in this Statement was known to any |
| | | individual designa | ted under 37 CFR § 1.56(c) more than |
| | | three months prior | to the filing of this Statement; AND |
| | | attached hereto is the fee s | set forth under 37 CFR §1.17(p) for |
| | | submission of this Informa | ation Disclosure Statement under 37 |
| | | CFR.§ 1.97(c); OR | |
| | | • • | Applicant requests that the information |
| | | contained in this Information Disc | closure Statement be placed in the file |
| • | | according to 37 CFR § 1.97(i), alt | hough the information may not be |
| | | considered by the USPTO. | mough the information may not be |
| | | This application relies, under 35 U.S.C. § | 120 on the earlier filing data of min |
| | | application No.[APPLICATION NUMBE | ER] filed on [FII ING DATE] and the |
| | | references cited therein are hereby referen | ced but are not required to be asset 1.1. |
| | | in this application under 37 CFR § 1.98(d) | oca, but are not required to be provided |
| | \boxtimes | Each item of information contained in this | |
| | | cited in a communication from a foreign p | aton office in a south |
| | | and the communication was not received by | atent office in a counterpart application, |
| | | § 1.56(c) more than thirty days prior to the | of the affiliant form of the Land of the Residual Control of the Land of the Residual Control of the R |
| | | § 1.56(c) more than thirty days prior to the Statement. 37 CFR § 1.704(d). | ining of this information Disclosure |
| | \boxtimes | | on the case of the |
| | | Applicant submits that no fee is required for Disclosure Statement. | or the consideration of this Information |
| | Consi | ideration of the listed references and favorable | La contraction of the second |
| | | ration of the fisted references and favorable | le action are solicited. |
| | | Respectfully | submitted, |
| | | XIAODONO | G HUANG et al. |
| | | | A 0 - |
| Dated: | June | 1 ,2003 By: Me | has In 2 2 |
| | | | W. Farn, Reg. No. 41,015 |
| | | FENWI | CK & WEST LLP |
| | | | Valley Center |
| | | | fornia Street n View, CA 94041 |
| | | | 0) 335-7823 |
| | | | 0) 938-5200 |

PTO/SB/08A (10-01)

Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE er the Páperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO Complete if Known Application No. 10/087,408 INFORMATION DISCLOSURE **Filing Date** March 1, 2002 STATEMENT BY APPLICANT First Named Inventor Xiaodong Huang Art Unit 2828 **Examiner Name** James W. Davie Sheet Attorney Docket Number of 2 22920-06460

| | | | U.S. PAT | ENT DOCUMENTS | | |
|--------------------|--------------|--|--------------------|---------------|--|----|
| | | Document No. | | | - | —– |
| Examiner Initials* | Cite No.1 | Number – Kind Code ² (if known) | Date MM-DD-YYYY | | Name of Patentee or Applicant of Cited Document | |
| | 1 | US-5,781,575 A | 07-14-1998 | Nilsson | | |
| | 2 | US-5,930,278 A | 07-27-1999 | Menigaux | | |

| | | | FOREIGN PATENT | OCUMENTS | |
|-----------------------|--------------------------|---|--------------------------------|--|--|
| | | Foreign Patent Document | | | |
| Examiner Initials* | Cite No. ¹ | Country Code ³ – Number ⁴ Kind Code ⁵ (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | |
| · | | | | | |

| | | OTHER REFERENCES – NON-PATENT LITERATURE DOCUMENTS | |
|-----------------------|--------------------------|---|----------------|
| Examiner Initials* | Cite No. ¹ | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published | T ⁶ |
| | 3 | Bloch, J. et al., "Room-temperature 1.3 µm emission from InAs quantum dots grown by metal organic chemical vapor deposition," <i>Applied Physics Letters</i> , American Institute of Physics, New York, U.S., Vol. 75, No. 15, October 11, 1999, pages 2199-2201. | |
| · | 4 | Evans, P.W. et al., "Edge-emitting quantum well heterostructure laser diodes with auxiliary native-oxide vertical cavity confinement," <i>Applied Physics Letters</i> , American Institute of Physics, New York, U.S., Vol. 67, No. 21, November 20, 1995, pages 3168-3170. | |
| | 5 | Garcia, J.M. et al., "Electronic states tuning of InAs self-assembled quantum dots," <i>Applied Physics Letters</i> , American Institute of Physics, New York, U.S., Vol. 72, No. 24, June 15, 1998, pages 3172-3174. | |
| | 6 | Kim, Jin K. et al., "Lateral Carrier Confinement in Miniature Lasers Using Quantum Dots," <i>IEEE Journal of Selected Topics in Quantum Electronics</i> , IEEE Service Center, U.S., Vol. 6, No. 3, May/June 2000, pages 504-510. | |
| | 7 | Ledentsov N.N. et al., "Interconnection between gain spectrum and cavity mode in a quantum-dot vertical-cavity laser," <i>Semiconductor Science and Technology</i> , Institute of Physics, London, G.B., Vol. 14, No. 1, 1999, pages 99-102. | |

| Examiner Signature | Date Considered | | |
|-----------------------|--------------------|---|---|
| | | l | • |

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609.

Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.

PTO/SB/08A (10-01)

Approved for use through 10/31/2002. OMB Q651-0031 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

nder the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO Complete if Known Application No. 10/087,408 INFORMATION DISCLOSURE Filing Date March 1, 2002 STATEMENT BY APPLICANT **First Named Inventor** Xiaodong Huang Art Unit 2828 Examiner Name James W. Davie Attorney Docket Number Sheet 2 of 2 22920-06460

| | | OTHER REFERENCES - NON-PATENT LITERATURE DOCUMENTS | _ |
|-----------------------|--------------------------|---|----------------|
| Examiner Initials* | Cite No. ¹ | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published | T ⁶ |
| | 8 | Park, Gyoungwon et al., "Temperature Dependence of Gain Saturation in Multilevel Quantum Dot Lasers," <i>IEEE Journal of Quantum Electronics</i> , IEEE Inc., New York, U.S., Vol. 36, No. 9, September 2000, pages 1065-1071. | |
| | 9 | Saito, Hideaki et al., "Controlling polarization of quantum-dot surface-emitting lasers by using structurally anisotropic self-assembled dots," <i>Applied Physics Letters</i> , American Institute of Physics, New York, U.S., Vol. 71, No. 5, August 4, 1997, pages 590-592. | |
| | 10 | Schur, Richard et al., "Vertical Microcavity Lasers with InGasAs/GaAs Quantum Dots Formed by Spinodal Phase Separation," <i>Japanese Journal of Applied Physics</i> , Tokyo, Japan, Vol. 36, No. 3B, March 15, 1997, pages 357-360. | |
| | 11 | Shchekin, Oleg B. et al., "Low-Threshold Continuous-Wave Two-Stack Quantum-Dot Laser with Reduced Temperature Sensitivity," <i>IEEE Photonics Technology Letters</i> , <i>IEEE Inc.</i> , New York, U.S., Vol. 12, No. 9, September 2000, pages 1120-1122. | |
| | 12 | Ustinov, V.M. et al., "High output power CW operation of a quantum dot laser," <i>Compound Semiconductors</i> 1999, Proceedings of the 26 th International Symposium on Compound Semiconductors, Berlin, Germany, August 22-26, 1999, Institute of Physics Conference Series, IOP Publishing Ltd., London, G.B., No. 166, pages 277-280. | |
| | 13 | PCT International Search Report, International Application No. PCT/US01/31256, May 27, 2003, 7 pages. | |
| | 14 | PCT International Search Report, International Application No. PCT/US02/06221, May 27, 2003, 4 pages. | |

| Examiner Signature | Date Considered | · · · · · · · · · · · · · · · · · · · |
|-----------------------|--------------------|---------------------------------------|
| | | |

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609.

Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶Applicant is to place a check mark here if English language Translation is attached.